
The Efforts of the Philosophers to Resolve the One Issue That Remains

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WHAT HAS been established so far in the light of all the evidence that is at present available? Two things. (1) On the level of *observable behavior*, no infirmative evidence as yet exists to falsify the proposition that man and man alone possesses a propositional language. The truth of this proposition carries with it the truth of the proposition that there is a manifest difference in kind between man and non-linguistic animals. (2) On the level of the *psychological explanation* of the observed behavior of both linguistic and non-linguistic animals, the application of the principle of parsimony produces two results. (a) The negative edge of Occam's razor cuts away the grounds for attributing to non-linguistic animals anything beyond the power of perceptual thought, in order to explain their behavior. (b) Its positive edge supplies the justification for attributing the power of conceptual thought to man and to man alone, since man's ability to name or designate objects and to make significant declarative sentences about them cannot be explained except in terms of man's having the ability to understand what different kinds of objects are like and his having the ability to make judgments about them in the light of such understanding. These two abilities together with the additional ability to draw inferences

from the judgments made or to construct arguments out of them, constitute the power of conceptual thought, the root of which is the ability to form and employ concepts.

The two aforementioned results of applying the principle of parsimony to psychological explanations of linguistic and non-linguistic behavior establish the truth of another proposition concerning the difference of man; namely, that man differs in kind from other animals on the *level of inferred psychological factors or processes* as well as on the *level of observed behavior*. The establishment of this proposition resolves the pivotal issue in the controversy about man. Since this leaves quite open the question whether the manifest and psychological difference in kind between men and other animals is superficial or radical, one issue still remains.

The question at issue can be stated in a number of ways. One way of stating it is to ask whether, on the *level of the neurological explanation* of man's observed behavior and of the power of conceptual thought that must be posited in order to give a satisfactory *psychological explanation* of linguistic behavior, no factors or processes need be posited that are not employed in giving a neurological explanation of the behavior of non-linguistic animals. If this question can be answered by showing that the only neurological difference between men and other animals, needed to explain man's having and other animals' lacking a propositional language and the power of conceptual thought, consists in a difference in degree of brain magnitude and complexity, then the issue can be resolved in favor of the proposition that man's difference in kind is only superficial, not radical. The statement just made must be expanded by adding one critical point: it must be shown that, in the continuum of degrees of brain magnitude and complexity, there is a threshold above which propositional language and conceptual thought occur and below which they do not; and that the size and complexity of man's brain lies above this threshold, and the brains of all other animals fall below it.

Another way of stating the question at issue is to ask whether the power and action of the human brain are *not only a necessary, but also the sufficient, condition* of man's having and exercising the power of conceptual thought, without which he could not exercise the power of propositional speech. The power and action

of the human brain constitute the *sufficient condition* of conceptual thought if conceptual thought can be *adequately explained* in terms of neurological mechanisms and processes. They constitute only a *necessary, but not the sufficient, condition* of conceptual thought, if conceptual thought *cannot be explained without reference* to neurological mechanisms and processes, but if it also *cannot be adequately explained by reference* to them. If, on the first alternative, we were to find that the brain is the sufficient condition of conceptual thought, then we would be justified in concluding that there is probably a critical threshold in the continuum of degrees of brain magnitude and complexity, below which conceptual thought does not occur, and above which it does. If, on the second alternative, we were to find that the brain is only a necessary, but not the sufficient, condition of conceptual thought, then, even though there might still be a critical threshold in the continuum of degrees of brain magnitude and complexity, this could not by itself explain man's possession of the power of conceptual thought that is totally lacked by non-linguistic animals. Hence, in the first alternative, man's difference in kind would turn out to be only superficial; in the second, it would be radical.

Still another way of stating the question is to ask whether the human brain, together with the entire sensory and motor apparatus that are its integral appendages, is the organ of conceptual thought in the same sense that it is the organ of perceptual thought (i.e., of sensations and sensory affects, of perceptions, perceptual residues such as sensitive memories and memory-images, and perceptual attainments such as perceptual abstractions), and of the initiation of all the bodily movements or reactions consequent thereon. One answer to this question claims that the brain is the organ of conceptual thought and of the linguistic behavior consequent thereon in exactly the same sense that it is the organ of perceptual thought and of the non-linguistic behavior that is thereby initiated. The opposite answer claims that, while the brain is an organ indispensable to conceptual thought and linguistic behavior, it is not the organ of conceptual thought in exactly the same sense that it is the organ of perceptual thought. The first answer leads to the conclusion that man's difference in kind from non-linguistic animals is only superficial; the second, to the conclusion that the difference is radical.

While these three ways of stating the question at issue are, in effect, equivalent, the third way makes explicit an assumption that is implicitly present in the other two. The opposite answers to the third question both accept the assumption that is made by the way the question is asked; namely, that the brain *is* the organ of perceptual thought and of the non-linguistic behavior consequent thereon. The two answers differ only with regard to whether the brain is *also the organ of conceptual thought in exactly the same sense*. The same assumption is implicit in the first two questions and is accepted by the opposite answers to them: thus, the first question assumes that a satisfactory neurological explanation can be given of perceptual thought and of non-linguistic behavior; and the second question assumes that the brain is the sufficient, not merely a necessary, condition of perceptual thought and non-linguistic behavior.

Another point of prime importance is common to all three ways of stating the question at issue. All three appeal to the principle of parsimony and appeal to it in the same way. In each case, what is being asked is whether there is any justification for positing a factor other than the power and action of the brain in order to explain conceptual thought and linguistic behavior. In each case, the negative answer maintains that conceptual thought and linguistic behavior can be adequately explained in neurological terms, and so, according to the principle of parsimony, there is no justification whatsoever for positing any non-neurological factor for explanatory purposes. And in each case, the affirmative answer maintains that conceptual thought and linguistic behavior cannot be adequately explained in neurological terms, and so the other side of Occam's razor works to justify the positing of a non-neurological factor for explanatory purposes.

The operation of the principle of parsimony in the resolution of the ultimate issue concerning man's difference precisely parallels its operation in the resolution that we reached in the preceding chapter of the pivotal issue in this controversy. But the two cases are not exactly alike. In the case of the issue concerning the psychological difference between man and other animals, when the principle of parsimony worked to show that something over and above the power of perceptual thought was needed to explain linguistic behavior, we had, in the power of conceptual thought, the factor that was needed. Here, however, if the prin-

ciple of parsimony works to show that some non-neurological factor is required to explain conceptual thought, we are left with a puzzling question. What is the nature of this other factor that is required, in addition to and in cooperation with the brain, in order to explain the psychological difference between men and other animals?

It seems evident that no other material factor—no other bodily organ, no other physiological mechanism or process—is needed to supplement the power of the brain and nervous system to provide an adequate explanation for conceptual thought. The non-neurological factor must, therefore, be an immaterial power of some sort. Since the word “immaterial” is as negative in its connotation as the word “non-neurological,” we have hardly advanced very far in solving the puzzle. Yet we may not be able to go very much further than this in answering the question. We can, of course, have recourse to such traditional terms as *mind*, *intellect*, or *reason*, and, by using them, say that the hypothesis to be tested here is whether conceptual thought can be adequately explained by reference to the action of the brain alone or can be adequately explained only by reference to the action of the mind or intellect in conjunction with the brain. But this statement must itself be made more precise by adding two qualifications: *first*, that the mind is *existentially and causally distinct* from the brain; and *second*, that its action is the action of an immaterial power and not of anything that can be described as a bodily organ.

When we have thus stated the position that is taken by those who affirm man's radical difference in kind (i.e., by those who deny that the action of the brain is the sufficient condition or adequate explanation of conceptual thought), we cannot go much further in specifying the character of the non-neurological (i.e., non-physical, non-bodily) factor. So far as we are able to conceive it, it remains essentially negative in character, and whether we call it “mind” or “intellect” or refer to it as an “immaterial factor” or an “immaterial power,” the question at issue, the opposite answers given to it, and the evidence and arguments offered in support of them, remain exactly the same.

However, there is one further point that must be made and made as clearly and emphatically as possible. The word “mind” or “intellect,” as used above to designate the immaterial factor or power that, according to one position on the issue, must be

posited in order to explain conceptual thought, *does not include the power of perceptual thought*. Let me stress this by spelling it out in the following way: (1) non-linguistic animals have the power of perceptual thought; (2) the assumption that the brain is the organ of perceptual thought, we saw earlier in this chapter, not only underlies all ways of stating the question at issue, but it is also adopted by opposite answers to that question; (3) in other words, all the phenomena of the perceptual order—sensations and sensory affects, sensitive memories and memory-images, perceptions and perceptual abstractions—can be adequately explained by reference to neurological factors and processes and, therefore, need no supplementary immaterial factor to complete the explanation; (4) hence, if the word “mind” or “intellect” is used to designate the immaterial factor that one answer to the question claims is needed to explain conceptual thought in man, these words cannot be univocally used to designate anything that is thought to enter into the make-up or constitution of non-linguistic animals.

Of course, the word “mind”—though perhaps not the word “intellect”—can be used in *quite another sense* to designate the kind of intelligence that non-linguistic animals possess, whereby they are able to solve problems by trial and error or insight, generalize from experience, achieve perceptual abstractions, learn to respond to cues, etc. Since both men and non-linguistic animals have the power of perceptual thought, in which sensitive intelligence and its related abilities reside, both men and other animals have minds *in this sense*, and in this sense mind is *not an immaterial (non-physical) factor or power that is existentially and causally distinct* from the brain and nervous system. But if mind in the sense of an immaterial or non-physical factor or power must be posited, as a factor over and above the central nervous system, in order to explain man's unique possession of conceptual thought, then non-linguistic animals are totally bereft of mind in the sense indicated.

In the light of the foregoing analysis of the one issue that remains, it seems reasonable and appropriate to refer to the answer that asserts the adequacy of a neurological explanation of conceptual thought as the *materialist* position on the issue; and to the opposite answer, which asserts the need for an additional and immaterial factor, as the *immaterialist* position. The

two positions, thus named, represent opposed philosophical theories or hypotheses. Each has arguments to advance in its own favor, objections to raise against its opponent, and replies to the objections raised against itself. And both must submit alike to the test of empirical evidence that may falsify the one or tend to confirm the other.

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It would be a happy circumstance if the whole matter could be left as just described. The issue is clear, the alternatives uncomplicated, the opposed answers squarely opposed. Unfortunately, the word "materialist" that I have used to name one of the two positions has connotations that either are not relevant to this issue or are wide of the mark; so, too, the word "immaterialist," especially the connotation that the mind, or the non-physical factor posited, is a relatively autonomous substance that is united with the body as a motor might be attached to or detached from the chassis of an automobile, or as a pilot is related to the ship that he steers.

In addition, the issue as stated above involves two conflicting hypotheses: on the one hand, the hypothesis of mind as a non-physical factor that operates in conjunction with a bodily organ such as the brain, and, on the other hand, the hypothesis of the brain alone as the sufficient condition of conceptual thought. It would be natural, therefore, for many readers who are acquainted with the philosophical literature of the mind-body problem to suppose that the controversy about the difference in man has, in its ultimate issue, now landed us squarely in the midst of that muddle.

That, fortunately, is not the case. The central questions in the mind-body problem, either in its classical formulation in the seventeenth, eighteenth, and nineteenth centuries or in the much improved versions of it that are now current, deal mainly, and sometimes exclusively, with the mind in that sense of the term in which it is common to man and other animals. Since mind in that sense of the term is equivalent to the power of perceptual thought and covers the domain of sensory phenomena, we are not at all concerned with the mind-body problem in that sense

of the word "mind." It is only on the periphery of the traditional mind-body problem that there are occasional questions about the relation of body to mind in the other sense—the sense in which it is posited to explain conceptual thought and, through it, man's unique possession of propositional speech.

These questions are variously stated, but I hope that I can show that they can all be reduced to the one question that I have stated as the ultimate issue in this controversy about the difference of man—especially to that form of the question which asks whether the brain is the sufficient, or only a necessary and not sufficient, condition of conceptual thought. When the one aspect of the mind-body problem with which we are here concerned is thus clarified, we will also, I think, be able to avoid having commerce with most of the traditional isms that complicate and sometimes obfuscate the discussion of the problem—hypotheses that go by such names as "psychophysical parallelism," "psycho-physical interactionism," "occasionalism," "epiphenomenalism," "double-aspect theory," "monistic materialism," and "dualism." Merely to recite this list of isms is like exhuming a whole series of corpses in the last stages of decay.

For the purpose of the present inquiry, the only question that concerns us is whether conceptual thought can be adequately explained in neurological terms. The hypothesis that it can be is currently called "the identity hypothesis," and when I call the position that adopts that hypothesis the "materialist position," I mean materialism in a sense that is acceptable to the exponents of the identity hypothesis and not the monistic or reductive materialism that they so explicitly reject. The opposite hypothesis, that I have called the "immaterialist position," might also be called "the non-identity hypothesis," since it affirms mind as an immaterial power that is existentially and causally distinct from the brain and nervous system. If the identity hypothesis ultimately proves to be the right answer, then the mind-body problem, both in its traditional form and in the special aspect of it that concerns us, will have been solved. But if the non-identity hypothesis should ultimately prevail, there would still be difficult questions to answer about the immaterial power or factor that must be posited, in addition to the brain, in order adequately to explain conceptual thought—such questions as precisely how it is related to the brain, how it co-operates with the brain, and so on.

While these questions are not to be dismissed out of hand as unimportant or as pseudo-problems, they are important and genuine problems *only if and after* the non-identity hypothesis is established. Since they are consequent upon its establishment, they have no place whatsoever in arguments *pro* or *con* bearing on its establishment. It makes no difference to the truth or falsity of the non-identity hypothesis whether these consequent problems can ever be satisfactorily solved. Hence, our present consideration of the issue with respect to which the identity hypothesis (the materialist position) and the non-identity hypothesis (the immaterialist position) are the opposed answers need not deal at all with the difficult questions that would have to be faced if the non-identity hypothesis were ever established.

Let me repeat: the only question with which we are concerned is whether the manifest and psychological difference in kind between men and non-linguistic animals is superficial or radical. To that question, the materialist exponents of the identity hypothesis answer: *only superficial*; the immaterialist exponents of the non-identity hypothesis answer: *radical*. The first answer is entirely compatible with the general continuity of nature and with the special evolutionary principle of phylogenetic continuity. The second answer is not compatible with the principle of phylogenetic continuity as that would apply to the origin of man. If an immaterial power must be posited to explain man's having conceptual thought and, through it, a propositional language, the emergence of man on earth cannot be genetically accounted for in the same way that genetics accounts for the origin of other species; and so the principle of phylogenetic continuity is violated and the general continuity of nature is breached—at this one point at least.

If the difference in kind between man and non-linguistic animals is radical, is it the *only* radical difference of kind in nature—the only break in the continuity of nature? It was once thought that the line that divided non-living from living things and the line that divided animal life from plant life sharply separated things that were radically different in kind. But the accumulation of scientific data bearing on these matters more and more favors the opposite view. While the manifest properties of animate and inanimate bodies are such that it would be incorrect to describe them as differing in degree rather than in kind,

nevertheless, current advances in biochemistry and in molecular biology strongly suggest that the difference in kind is superficial, not radical; i.e., it does not involve any new factors—any factors other than those operative in the realm of inorganic things. Hence, it seems reasonable to expect that in the not too distant future a living organism capable of reproducing itself will be synthetically produced in the laboratory. As for the difference between plant and animal life, that too, in terms of the manifest properties of these two types of living organisms, appears to be a difference in kind, not degree (even allowing for the difficulty of classifying certain unicellular organisms, and such borderline cases as the sensitive plant). But here, even more overwhelmingly than with regard to the difference between living and non-living things, the weight of the scientific evidence supports the conclusion that the difference in kind is only superficial, not radical. The principle of phylogenetic continuity is not violated by the emergence of animal life.

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This conclusion is strengthened by the support it receives from the philosophical theory that is now called "the identity hypothesis." According to this theory, as I indicated earlier, the power of perceptual thought can be adequately explained in neurological terms: the brain is the sufficient condition for the occurrence of all psychic phenomena that are sensory in character, including such sensory residues as memories and images, and such perceptual attainments as perceptual abstractions. To account for the existence or reality of such phenomena, no causes need be sought beyond the physical or material factors that are operative in neurological mechanisms and processes.

The argument for the identity hypothesis, boiled down to its essentials, involves three steps. (1) All the empirical evidence now available shows that the brain is a necessary condition of sensory or perceptual occurrences and processes, i.e., the latter have never been found to occur without the accompaniment of brain events or processes. (2) In view of the fact that the psychic phenomena in question can be experimentally produced by activating the central nervous system in certain specified ways, brain

action is not only a necessary condition in the sense of *sine qua non*, but also the productive cause of the psychic phenomena in question. (3) Since there is no need for an additional cause or a cause of another type to explain the phenomena, the principle of parsimony operates to make the action of the brain not merely a necessary, but the sufficient condition of sensory or perceptual occurrences or processes—everything that can be ascribed to the exercise of the power of perceptual thought.

I will expound and examine this argument more fully in the next section, where we will be concerned primarily with its extension to the sphere of conceptual thought. For the moment, I wish only to say that I can see nothing wrong with it so far as it applies to the sensory or perceptual order. With the one exception of the difficulty of explaining parapsychic phenomena, such as ESP, in neurological terms, the exponents of the identity hypothesis seem able, in my judgment, to answer all the objections and resolve all the difficulties that have been raised against them or that they confront themselves with (and the evidence for parapsychic phenomena is itself so dubious or questionable that it hardly constitutes a serious difficulty at this stage of scientific investigation). [1]

I said a moment ago that the identity hypothesis, as applied to sensory or perceptual occurrences and processes, confirms the view that the difference between animals with sensory or perceptual powers and plants without them is only a superficial, not a radical, difference in kind. The converse is equally true: all the scientific evidence that now supports that view and, with it, the phylogenetic continuity of plant and animal life, also confirms the identity hypothesis, so far as it applies to sensory or perceptual phenomena. Hence, those among contemporary philosophers who oppose the identity hypothesis on the sensory or perceptual level, in addition to propounding philosophical objections or difficulties (which they do), must also give reasons for thinking, contrary to the best scientific evidence available, that the difference between animals with sensory or perceptual powers and plants without them is a radical difference in kind—a difference that violates the principle of phylogenetic continuity. *This they do not do.* [2]

The identity hypothesis thus has a clear and substantial advantage over the non-identity hypothesis with respect to the explana-

tion of sensory or perceptual phenomena. I can find no reason for hesitating to say that, in the light of all relevant evidence and arguments, it is much the *truer* of the opposed philosophical theories, so far as that can be judged in the light of the arguments *pro* and *con*. But since the question is not a philosophical one, but a mixed question involving science as well as philosophy, the confirmative weight of the scientific evidence cannot be ignored. When this is taken into account, it greatly increases the truth of the identity hypothesis relative to that of the opposing hypothesis, insofar as both apply to psychic occurrences or processes that are common to man and non-linguistic animals.

The only problem that remains, therefore, is which of the conflicting hypotheses is true with respect to those psychic occurrences or processes that are to be found only in man—the formation and use of concepts, the making of judgments and of inferences; in short, the occurrences or processes that take place when men exercise their power of conceptual thought. How far do philosophical arguments *pro* and *con* go toward resolving the issue that is constituted by these opposed hypotheses? Can it be resolved philosophically; and if not, how can it be resolved? Since the issue to be resolved is the ultimate issue concerning the difference of man (i.e., the issue whether man's difference in kind is only a superficial or is a radical difference in kind), the rest of this chapter as well as Chapters 13 and 14 are devoted to it. To guide the reader in following the course of the argument, let me outline the steps I now propose to take.

In Sections 4 and 5 of this chapter, I will consider the philosophical arguments for and against the identity hypothesis or the materialist position with regard to conceptual thought. In Sections 6–9, I will consider the philosophical arguments for and against the non-identity hypothesis or the immaterialist position with regard to conceptual thought. In both cases, I can do no more than summarize the gist of arguments, objections, and answers to objections as these appear in the vast and ever-growing literature on this subject. (A bibliography of relevant books and papers prepared by Professor Feigl and confined to recent publications runs to 359 items. [3]) Substantiation and, in some cases, amplification of points made in the text will be supplied in the notes. The reader who does not wish to pursue the matter further can ignore the notes; they are provided for the reader whose interest

in the matters treated is great enough to sustain reading considerably further.

(4)

Among contemporary proponents of the identity hypothesis, the leading figures include such philosophers as Gilbert Ryle of Oxford; Herbert Feigl, Director of the Center for the Philosophy of Science at the University of Minnesota; Wilfrid Sellars of Yale; Kenneth Craik, late Fellow of St. John's College, Cambridge; J. J. C. Smart and U. T. Place, both of the University of Adelaide, South Australia; Hilary Putnam of M.I.T.; Stephen Pepper of the University of California; and Anthony Quinton of Oxford. [4] While it is not inappropriate to call all of them materialists in the sense that they deny autonomous existence or causal efficacy to anything immaterial, it is important to record their unanimous rejection of the crude and philosophically untenable doctrine that is associated with the name of materialism across the centuries, and that has been given some currency in our own time through its adoption by psychologists who are metaphysical as well as methodological behaviorists. The proponents of the identity hypothesis refer to such materialism as "reductive materialism" because it denies the reality of the psychological, treats it as illusory, or converts the language used for describing such phenomena into just another way of speaking about physical occurrences or processes.

In attacking such reductionism, which goes to the extreme in identifying the psychological with the physical, proponents of the identity hypothesis are, of course, joined by their opponents. [5] That is to be expected from those who oppose the identity hypothesis; it could hardly be otherwise. But the fact that proponents of the identity hypothesis reject the reductive identification of the psychological with the physical calls attention to the non-reductive sense of identity that distinguishes these philosophers from the crude materialists whom they criticize. It is of critical importance to the understanding of their hypothesis to get this sense of the term as clear as possible.

Two things are analytically inseparable if the meaning or understanding of the one is indistinguishable from the meaning or

understanding of the other. Two things are existentially inseparable if, though analytically or logical distinguishable, they never occur or exist in separation from one another. Such existential inseparability may be either necessary or contingent: *necessary* if it is intrinsic to the nature of the things conjoined, so that it is impossible to conceive the occurrence of the one without the accompaniment of the other; *contingent*, if it is simply a matter of empirical fact that whenever the one occurs, we also always find the other.

Now in the strictest meaning of the word "identity," two things, if they are distinguishable in any way, cannot be identical, for strict identity, as Leibniz pointed out, is the identity of indiscernibles, and *indiscernibility negates twoness in any respect*. Hence, wherever we have both analytical and existential inseparability, we have the strict identity of a thing with itself, not the identity of two things. In its most extreme form, the reduction of the psychical to the physical is an identification that annihilates the psychical as having any independence in meaning or existence. But if the psychical and the physical are analytically or logically distinguishable, so that what is properly said of the one cannot be properly said of the other, then their twoness is not obliterated even if they are existentially inseparable from one another. To speak of them as identical when they are only existentially inseparable from one another is, of course, a much weaker sense of identity than is connoted by the identity of indiscernibles, and that sense is further weakened if the existential inseparability is empirical and contingent rather than *a priori* and necessary.

It is in this weakest possible sense of identity that the identity hypothesis asserts the identity of the psychical and the physical. Some confusion and misunderstanding might have been avoided if the word, so far removed in meaning from its strict sense, had not been used at all, and the doctrine had been described as a moderate or non-reductive materialism that (1) asserted the empirically known and contingent concurrence (in a one-one relationship) of the psychical and the physical (more particularly, the concurrence of sensory or perceptual phenomena with brain states or processes); and (2) asserted the physical to be the sufficient condition of the psychical, i.e., the action of the brain and nervous system to be the sufficient condition of the happenings

that are described as sensations, feelings, images, memories, perceptions, and as conceptions, judgments, and inferences.

The step from the first to the second of these two assertions is accomplished by applying the principle of parsimony, a step that is explicitly acknowledged by the best expositors of the identity hypothesis or the non-reductive materialist position. [6] According to Professor Feigl, it is the taking of this step that distinguishes the identity hypothesis from such other views of the mind-body relationship as psychophysical parallelism and epiphenomenalism, which start from the same first premise; namely, that there is a one-one relationship and concurrence between physical and psychical states or events. [7] As I pointed out earlier, the principle of parsimony is used to reject as unnecessary the appeal to any causal conditions other than neurological occurrences or processes, in order to explain the so-called "mental" states or events that are paired with these neurological occurrences or processes in one-to-one correspondence. Not only do the so-called "mental" states or events fail to occur in the absence of brain states or processes (which means that brain action is a necessary or *sine qua non* condition of their occurrence), but nothing more or other than brain states or processes is needed for their occurrence (which means that brain action is the sufficient condition for their coming to be or happening).

With significant exceptions that will be noted in a moment, the critics of the identity hypothesis attack it exclusively on the level of what I would call "subhuman or animal mentality"—the level of sensory and perceptual phenomena that are common to both linguistic and non-linguistic animals. [8] Similarly, when the proponents of the identity hypothesis enumerate objections or difficulties that they then try to answer or resolve, these are without exception on the level of sensory and perceptual phenomena. Of the ten problems that Professor Feigl regards as serious enough to discuss in detail, not one is on the level of conceptual thought; the same is true of the eight objections that Professor Smart is at great pains to answer. [9] We need spend no time on these refinements of the theory since, as I remarked earlier, the theory is sufficiently well established as the truer of the two competing hypotheses with regard to all phenomena on the sensory or perceptual level.

Turning now to the level of conceptual thought, where the relative truth of the competing hypotheses bears directly on the precise character of man's difference in kind from non-linguistic animals, we must observe two things: first, that the general framework of argument for the identity hypothesis remains exactly the same on this level as on the perceptual level; and second, that within the same general framework, a few authors, notably Wilfrid Sellars and Kenneth Craik, advance arguments specifically directed toward establishing the first premise of the identity hypothesis on this level; namely, the existential inseparability and factual concurrence of brain processes and conceptual processes. Other authors in this group who mention the process of conceptual thought do no more than assume that the arguments they have already advanced on the level of perceptual thought apply with as much force to conceptual thought as well.

Sellars pivots his discussion of the problem on a comparison of Descartes and Hobbes. In his view, Hobbes treated the relation of conscious thought to neurophysiological processes as identical with the relation of conscious sensations to sensory states of the brain. Descartes, on the other hand, "not only refused to identify [conceptual thinking] with neurophysiological process, he did not see this as a live option, because it seemed obvious to him that no complex neurophysiological process could be sufficiently analogous to conceptual thinking to be a serious candidate for being what conceptual thinking 'really is.'" As between Hobbes and Descartes, Sellars thinks that advances in science and philosophy favor Hobbes. "In the light of recent developments in neurophysiology," he writes, "philosophers have come to see that there is no reason to suppose that there can't be neurophysiological processes which stand to conceptual thinking as sensory states of the brain stand to conscious sensations." [10]

The only argument that Sellars offers for this view of the matter turns on the analogy between conceptual thought and propositional speech: concepts or thoughts are related to one another as words and sentences are related to one another. But "to point to the analogy between conceptual thinking and overt speech," he remarks, "is only part of the story, for of equally decisive importance is the analogy between speech and what sophisticated computers can do, and finally, between computer circuits and conceivable patterns of neurophysiological organization. All this,"

he adds, "is more or less speculative, less so now than even a few years ago. What interests the philosopher is the matter of principle. . . ." And on that decisive point, Sellars concludes that "if thoughts are items which are conceived in terms of the roles they play"—analogous to the roles that words and sentences play in propositional speech—"then there is no barrier *in principle* to the identification of conceptual thinking with neurophysiological process." [11]

Craik's argument, though expressed in different terms, closely resembles that of Sellars. The fundamental feature of neural machinery and also of calculating machines, in Craik's view, is their ability to "parallel or model external events" in their order and relationship. [12] The order and relation of thoughts, as symbolized in words or numbers, also models or parallels the order and relationship of external events; in such modeling or paralleling, their truth consists. Hence, Craik is persuaded that it is reasonable to hypothecate the identifiability of conceptual thinking with neurological processes. Accordingly, "general meaning or meaningfulness . . . would be the power of words to symbolize things and events through the neural events which parallel those things and give rise to words and images." [13]

In a later book, commenting on this hypothesis as to the nature of thought, Craik confesses that it is yet far from being established that "ideas and neural patterns" can be viewed "as if they were almost synonymous"; that is not possible, he says, "in the present stage of physiology and psychology." Nevertheless, he repeats his conviction about the underlying principle of the identity hypothesis as applied to conceptual thought: "I see no reason to suppose," he writes, "that concepts and reasoning are fundamentally different from the mechanisms of physical nature." [14]

(5)

The opponents of the identity hypothesis as applied to conceptual thinking do not deny that neurological processes may be an indispensable or *sine qua non* condition of conceptual thought, but they argue that the meanings—or, in their language, the "intentionalities"—which are identical with concepts and which confer significance on the names or designators that we use in

propositional speech cannot be adequately explained in neurological terms; and so the action of the brain and nervous system is not the sufficient condition of conceptual thought. Professor Popper's way of saying this is summarized in his thesis that "no causal physical theory of the descriptive and argumentative functions of language is possible"; in other words, no neurological or mechanical explanation can be given of the meanings involved in our use of designative names, and even less so of the meanings involved in the sentences whereby we express inferences. [15] Professor Price of Oxford, in a discussion of papers on the mind-body problem by Anthony Quinton, also of Oxford, and John Beloff of Edinburgh, points out that "if Brentano is right in saying that all mental events have intentionality and that no physical events have it, this would seem to be a conclusive objection to the Identity Hypothesis." [16] A lengthy appendix in the volume that contains Professor Feigl's comprehensive essay on the mind-body problem deals with "intentionality and the mental"; it contains correspondence between Professors Chisholm and Sellars on the subject, in which Professor Chisholm of Brown University spells out the point made above by Professor Price; namely, that the intentionality of thoughts makes it impossible to identify thoughts with brain states, in any sense of identification that would make brain states or processes the adequate explanation or sufficient condition of conceptual thought. [17]

Replying to Chisholm, Sellars reiterates the position that he took in his earlier paper on the subject. He calls attention to the fact that "the analogy between the way in which thoughts are connected with one another and with the world . . . and the way in which overt linguistic episodes are so connected . . . makes it sensible to envisage the identification of thoughts *in their descriptive character* with neurophysiological episodes in the central nervous system." [18] The intentionality characteristic of thoughts, in Sellars' view, can be adequately explained by the semantics of overt verbal behavior. [19] Professor Putnam goes further in pointing out, against Chisholm's thesis concerning intentionality, that structural linguistics and empirical semantics can account for all linguistic behavior without any reference to intentionality, meaning, or concepts. Should Chisholm contend that a behavioristic semantics which omits intentionality cannot succeed in explaining human language, that, according to Putnam, would

be irrelevant even if true; because "if *any* semantical theory can fit human language, it has to be shown why a completely *analogous* theory would not fit the language of a suitable machine."
[20]

In his consideration of Brentano's thesis about the identification of the intentional with the mental and its non-identifiability with the physical, Anthony Quinton discusses and criticizes the views of Popper and Chisholm noted above. He concludes by trying to explain why, in his judgment, Brentano's thesis does not rule out the identity theory.

Its immediate victim is behaviorism. It aims to prove that there is more to thinking and meaning than verbal and other behavior, that there are mental processes . . . over and above such behavior. . . . But the identity theory does not deny that mental events and states . . . are distinct from verbal and other behavior. It takes them, after all, to be causally related to such behavior. What it does maintain is that every such introspectibly discriminable mental state is also a discriminable brain state. Now if such brain states are not irreducibly intentional, does it follow that they cannot be identical with mental states? It does not, because the identity theory does not regard the physical and mental descriptions of states of mind as *logically* equivalent. Only a contingent identity is claimed for physical states of the brain and introspectible states of mind. [21]

Professor Feigl reaches the same conclusion: that Brentano's thesis, even if true, poses no serious difficulty for the identity hypothesis as applied to conceptual thought. [22]

To summarize the discussion that we have just surveyed, I would call the reader's attention to three points.

(1) The positive argument for the identity hypothesis, as advanced by Sellars and Craik, has its crux in the parallelism or analogy between the order and relation of concepts in thought and the order and relation of the verbal elements in propositional speech. Turning on that crux, the argument proceeds as follows: a similar parallelism can be found between the order and relation of verbal elements and the order and relation of neural events or of computer states; it should, therefore, be possible to explain

language in neurological or mechanical terms; and if that is possible, it should be possible to explain conceptual thought in neurological or mechanical terms. Sellars and Craik do not assert that a completely satisfactory or adequate explanation has yet been given; they merely contend that they see *no difficulty in principle* about giving one.

(2) The opponents of the identity hypothesis, especially Popper and Price, base their criticism of it on the intentionality or meaning that constitutes the elements of conceptual thought: concepts are the intentions or meanings through which all signs, both verbal and non-verbal, get their significance. They then argue as follows: since that which is mental is intentional and that which is physical is not, they cannot be identified; nor can an adequate physical explanation be given of the intentionality that is constitutive of the elements of conceptual thought.

(3) Against such criticism, the defenders of the identity hypothesis point out that their theory does not call for the analytical inseparability or indistinguishability of the mental and the physical—the intentional and the non-intentional. It asserts only that they are existentially inseparable in an empirical and contingent manner. This being so, the action of the brain is at least a necessary condition of conceptual thought; and there is good reason to suppose that it is also the sufficient condition, in view of the purely mechanistic explanations of man's propositional speech that can now be given by structural linguistics and empirical semantics.

(6)

In Section 4, we saw the necessity for distinguishing between the identity hypothesis and the extreme form of materialism that is reductive; only the moderate materialism of the identity hypothesis is tenable and defensible. Here it is necessary to distinguish an extreme form of the immaterialist position from the more moderate hypothesis that, in the light of available scientific evidence, is tenable and defensible, as the extreme form of immaterialism is not. In considering the philosophical dispute on the issue of whether man's difference in kind is radical or superficial, we shall be concerned only with the conflict between the two hypotheses that, while opposed on philosophical grounds, are

equally compatible with the scientific evidence that is germane to the issue.

Of the philosophers cited in Chapter 4 as affirming man's radical difference in kind, two—Plato and Descartes—are representatives of the extreme immaterialist position, and two—Aristotle and Aquinas—are exponents of the more moderate view. Two points characterize the extreme position: (1) the mind, intellect, or rational soul is conceived as an immaterial substance, united to the body in the manner in which two relatively autonomous entities might be conjoined; e.g., as the motor is united with the chassis or as the pilot is united with the ship—the ghost in the machine. The resulting unity is one of association rather than of being or existence. Hence, (2) the body is not even a necessary, much less the sufficient, condition for the existence and functioning of the mind, intellect, or rational soul: the latter can exist *in separation from the body*, and when they are conjoined, the relation between acts of the mind and acts of the body is a one-many or many-one rather than a one-one relationship.

The proponents of the identity hypothesis would, of course, deny the truth of these two propositions, but so would the adherents of the moderate immaterialist position. Unfortunately, most of the contemporary philosophers who have adopted the identity hypothesis in one form or another are unacquainted with the moderate immaterialist position. Beginning with Ryle, they proceed on the incorrect assumption that all opponents of materialism espouse the ghost in the machine. So far as the moderate immaterialists are concerned, they are attacking a straw man, just as much as the immaterialists would be doing if they attacked the materialist position conceived solely in its extreme reductive form. It is additionally unfortunate that the contemporary philosophers who reject the identity hypothesis do so without adequate knowledge or understanding of the arguments that have been advanced on their own side of the issue—arguments that not only operate against the identity hypothesis but also against the ghost in the machine. [23]

In contradistinction to the extreme form of the immaterialist position, as that is typified by the doctrines of Plato and Descartes, the moderate form of it, typified by the doctrines of Aristotle and Aquinas, can be defined in terms of the following three propositions. (1) Bodily events or processes, particularly brain

states or processes, are a necessary—an indispensable or *sine qua non*—condition of mental acts, such as the acts of forming and using concepts, of making judgments and inferences. They stand in a one-one relationship, not a one-many or a many-one relationship. This is affirmed as a matter of empirical fact and, therefore, as a contingent, not a necessary, connection. But (2) brain action is *not the sufficient condition or sole cause* of the aforementioned mental acts. The arguments relative to this proposition try to show that it *cannot* be. (3) The additional cause required for the explanation of these acts is the mind or intellect conceived not as an immaterial substance, but as a power possessed by man, differing from all of his other powers in *one respect and one respect only*; namely, that it is an immaterial power not embodied in a physical organ, such as the stomach, the eye, or the brain. According to this third proposition, it is the immateriality of the power of conceptual thought that must be posited in order to explain the mental acts that cannot be adequately explained in neurological terms alone.

In other words, just as earlier the principle of parsimony was used to justify positing man's possession of the power of conceptual thought in order adequately to explain his possession of a propositional language, so here, the proponents of the moderate immaterialist view contend, the principle of parsimony can be used to justify positing the immateriality of that same power in order adequately to explain the mental acts which the identity hypothesis tries to explain solely in neurological terms. Thus we see that the two moderate positions on the ultimate issue about man's difference in kind completely agree on one proposition and appeal to the same principle as the basis for their disagreement on another. They agree on the proposition that the action of the brain is an indispensable or *sine qua non* condition of the mental acts to be explained (i.e., conception, judgment, inference). They disagree about whether anything in addition to brain action need be posited to explain these acts.

Since both sides affirm man's possession of the power of conceptual thought, the basic difference between them lies in the way they conceive this power: either (a) as a power of the brain, in which case brain action is the sufficient condition of the acts in question, or (b) as an immaterial or non-physical power associated in its action with the power and action of the brain, in

which case brain action is only a necessary and not the sufficient condition of the acts in question. In their disagreement on this crucial point, both sides appeal to the principle of parsimony, one using its negative edge to deny the need to posit anything beyond brain action, the other using its positive edge to justify the need for positing the immateriality of the power of conceptual thought. [24]

Within the framework of these agreements on the empirical facts and on the controlling principle, the one point in dispute is sharply defined and the debate of it should be better conducted than most philosophical controversies are. Unfortunately, as we shall see, that is not the case, largely for reasons of ignorance and misunderstanding on both sides. The contemporary exponents of the identity hypothesis, like the contemporary philosophers who criticize them, are unacquainted with the arguments for the immateriality of the mind or intellect conceived not as a substance, but as a power, i.e., the power of conceptual thought. And most of the scholastic philosophers alive today who might uphold the position of Aristotle and Aquinas in this dispute seem to be unacquainted with the identity hypothesis and the arguments for it; they, for the most part, continue to attack the straw man of extreme or reductive materialism; in addition, they do not know how to marshal their own arguments in a way that might make them intelligible to contemporary ears.

Before I attempt to supplement the contemporary discussion by adding the crucial argument for the immaterialist position that is not represented in it, let me briefly comment on two points that do appear in the current literature—one critical, the other constructive.

The first point is the one made by such writers as Price, Brandt, Beloff, and others in their criticism of the identity hypothesis. They heed the cautionary statements of the exponents of that hypothesis that (1) the inseparability of mental acts from the action of the brain is only existential, not analytical; and that (2) the existential inseparability is only contingent insofar as it is empirically known, not necessary as it would be if it could be known *a priori*. These qualifications, in their opinion, so weaken the meaning of identity that the force of that term is totally lost. With it removed from the dispute, all that is left then is the proposition on which both sides can agree; namely, that the action

of the brain is a necessary or *sine qua non* condition of mental acts. [25]

The second point is the one that is introduced into the discussion by Popper, Price, Chisholm, and others, as was pointed out in the preceding section. [26] It involves the thesis that these authors attribute to Brentano—that intentionality or reference is the exclusive property of mental acts; it does not belong to the order of physical events, nor can it be produced by purely physical conditions or occurrences. Accordingly, brain states or processes cannot be the sufficient condition or sole cause of such mental acts as conception, judgment, and inference, all of which are intentional acts. Let me spell this out by one further statement of the point. The act of digesting is not a mental act in the sense defined; it is not intentional; it can, therefore, be the act of a bodily organ, such as the stomach. The act of forming concepts and the act of using them to make judgments and inferences are mental acts; they are intentional; they cannot, therefore, be the acts of a bodily organ such as the brain or central nervous system. [27]

I have, for a reason that will presently become clear, omitted reference to acts of perception, memory, and imagination. According to the identity hypothesis, these are acts of the brain and its sensory appendages. According to such contemporary philosophers as Price and Chisholm, these are intentional acts and so they cannot be acts merely of the brain and its sensory appendages, as digestion is an act of the stomach. But according to Aristotle and Aquinas, the acts of perception, memory, and imagination are not intentional acts of the same type as the acts of conception, judgment, and reasoning, and so they can be acts of the brain and its sensory appendages in exactly the same way that digestion is an act of the stomach, whereas the intentionality of conception, judgment, and inference is such that these acts cannot be acts of the brain as seeing is the act of the eye and the brain, or as memory and imagination are acts of the brain.

In short, according to Brentano and his contemporary followers, it is intentionality *as such* that distinguishes the mental from the physical; but according to Aristotle, Aquinas, and those who understand their doctrine, as Brentano, Price, Chisholm, and others obviously do not, it is only a certain type of intentionality that is the exclusive property of the mental; i.e., it is only a

certain type of intentional act that cannot be the act of bodily organs such as the sense organs and brain. The contemporary philosophers who, in the dispute about the identity hypothesis, refer to Brentano's thesis, appear to think that Brentano is the original source of the insight about the intentionality of mental acts. It is difficult to understand their thinking so, for I would have supposed that it is a matter of common knowledge that Brentano was reared in the tradition of scholastic philosophy and that his doctrine of the intentionality of mental acts goes back through Aquinas to Aristotle, where it originated.

Knowing only Brentano's incorrect statement of the doctrine of intentionality, his contemporary followers repeat his mistake. If the intentionality of sensory or perceptual acts were the same as the intentionality of conceptual acts, they would be mental acts *in the same sense*; from this it would follow that mind is present, *in the same sense*, in non-linguistic animals with perceptual powers and in man with both perceptual and conceptual powers; and it would then further follow that perceptual acts as well as conceptual acts cannot be acts of bodily organs, as digestion is an act of the stomach: in which case, as a final consequence, it would follow that a radical difference in kind exists between plant life, on the one hand, and animal and human life, on the other, but that the difference between man and non-linguistic animals is at most only a superficial difference in kind.

If Brentano's statement of the Aristotelian doctrine were correct, we would expect Aristotle and Aquinas to maintain that the acts of perception, memory, and imagination are not acts of such bodily parts as the sense organs and the brain, any more than conceptual acts are. Anyone who will take the trouble to examine their writings can soon find out that they say no such thing. On the contrary, they assert as explicitly as possible that all sensory acts, including the acts of the interior sensitive powers—the acts of perception, sensitive memory, imagination, and cogitation—are acts of bodily organs. [28] In their view, only conceptual acts—such as the acts of understanding or concept-formation and the acts whereby concepts are used in judgments and inferences—cannot be merely acts of the brain, though they *never occur without* acts of the brain, since the exercise of the sensitive powers is empirically discovered to be an indispensable condition for man's exercise of his intellectual or conceptual

power. [29] Hence, they attribute immateriality only to man's intellectual or conceptual power, and not to his sensory or perceptual power; they posit the immateriality of the conceptual power in order to explain conceptual acts, but they see no reason to posit the immateriality of the perceptual power in order to explain perceptual acts. [30] And though they acknowledge that both perceptual and conceptual acts are intentional, they regard the intentionality of conceptual acts and the intentionality of perceptual acts as analogical, not univocal; and so what is true of the one (i.e., the immateriality requisite to explain the intentionality of conceptual acts) need not be true of the other. [31]

Still another important point remains to be made. The contemporary philosophers who appeal to Brentano's doctrine of intentionality merely re-assert his thesis that intentionality belongs to the order of mental acts and not to the order of physical acts; but, to my knowledge, they fail to give reasons for this assertion, i.e., they fail to advance arguments to show why intentionality cannot be present in purely physical acts. This abstention from argument would be justified and appropriate if the proposition about the immateriality of the intentional were self-evident. Descartes, for example, regards it as self-evident that matter cannot think, and so, in view of the fact that thinking is going on, he asserts without further argument that thinking must be done by an immaterial substance—a substance to which thinking is as intrinsic as extension is to a material substance or body. But if it is not self-evident that matter cannot think, as Locke holds and as most contemporary philosophers maintain, then arguments must be offered for positing the immateriality of that which thinks. And the proposition about the immateriality of the intentional is certainly even less capable of being regarded as self-evident than the proposition that matter cannot think. [32]

(7)

The arguments required to establish the proposition that matter cannot think (i.e., that conceptual acts cannot be acts of the brain) were first formulated by Aristotle and Aquinas and, to my knowledge, are to be found only in the philosophical tradition that stems from them. Furthermore, they are arguments specifi-

cally designed to justify attributing immateriality *only* to the power of conceptual thought, *not* to the perceptual powers as well; i.e., these arguments do not try to establish the immateriality of the intentional as such, but only the immateriality of that type of intentionality which is to be found in the mental acts of conception, judgment, and inference.

I have purposely used the word "arguments" in the plural because, as a matter of historic fact, there are at least three distinct reasons advanced by Aristotle and, following him, by Aquinas as the grounds for attributing immateriality to the intellect, the power that they call the power of understanding and that we have been referring to as the power of conceptual thought. In whichever way it is named, the acts of this power are the same—the act of concept-formation and the acts of using concepts to make judgments and inferences. In what follows, however, I will confine myself to summarizing *only one* of the aforementioned arguments, because of the other two, in my judgment, one is fallacious, and the other appeals to empirical observations that are questionable and will remain so until they are made with the technique and precision of modern scientific investigation. [33]

Before summarizing the one argument that seems to me still to have philosophical cogency, there is one final observation I would like to make. It concerns the somewhat paradoxical character of introducing an argument drawn from Aristotle and Aquinas into the dispute of the mind-body problem as that has developed in modern thought since the time of Descartes. Opinions on this subject that I have harbored for many years have recently been confirmed by a penetrating and scholarly essay of Professor Wallace I. Matson of the University of California, entitled "Why Isn't the Mind-Body Problem Ancient?" [34]

Professor Matson points out that the Cartesian and post-Cartesian formulation of the mind-body problem, as well as the various solutions of it that have been advanced under the names of the various isms enumerated earlier in this chapter, would have mystified the ancient Greeks. "The Greeks," he writes, "did not lack a concept of mind, even of a mind separable from the body. But from Homer to Aristotle, the line between mind and body, when drawn at all, was drawn so as to put the processes of sense perception on the body side." [35] Hence, in the sense of mind

in which most contemporary exponents of the identity hypothesis use that term (i.e., to stand for sensory or perceptual acts or experiences), Aristotle and his predecessors would have "subscribed to this theory," as Professor Matson says, not as one solution to a philosophical puzzle, but rather as an obvious truth that no Greek ever gainsaid or even could have thought of challenging. "Indeed, in the whole classical corpus," Matson tells us, "there exists no denial of the view that sensing is a bodily process throughout"—not only sensing, but all the acts and manifestations of the perceptual power that is common to men and non-linguistic animals (i.e., memory, imagination, etc). [36]

These observations seem to me much more completely true of Aristotle than any other Greek philosopher. Plato, for example, would have understood Descartes much better than Aristotle could have, especially the Cartesian separation of mind and body into existentially distinct substances and the Cartesian view of the mind's independence of the body. So, too, Democritus would have understood Hobbes much better than Aristotle could have, especially the Hobbesian identification of mind with body that is a precursor of the identity hypothesis in contemporary thought about the mind-body problem. To Aristotle, Descartes and Hobbes would have seemed relatively unintelligible extremists who, like Plato and Democritus with whose doctrines he was acquainted, mixed truth with untruth—the one by not seeing the dependence of even intellectual or conceptual mind on body, the other by not seeing that bodily processes cannot adequately explain intellectual or conceptual acts as they can fully explain sensory or perceptual ones.

In the hylomorphic doctrine that is Aristotle's most original contribution, it is impossible for the mind-body problem to arise, either on the perceptual or on the conceptual level. And after it has arisen in Cartesian or post-Cartesian terms, it is impossible to translate it back into Aristotelian terms in order to pose the problem in a way that an Aristotelian could understand well enough to try to solve it. The point is not that there is no Aristotelian solution to the mind-body problem; the point is rather that, within the framework of Aristotelian metaphysics and psychology, there can be no mind-body problem.

In the hylomorphic view of being and becoming, of inanimate and animate nature, and of man, the twin pairs of polar principles

—matter and form, potency and act—lead to the conception of the soul as nothing but the form and first actuality of an organic body having the potentiality of life; and all vital operations, from digestion and locomotion to imagination and conceptual thought, are the second acts (or actualizations) of the living organism's powers or potentialities. In this view, the soul is inseparable from the organic body of which it is the form, just as the seal impressed on the wax is inseparable from the wax; and this applies to the human or rational soul just as much as it applies to the sensitive souls of brute animals, and to the vegetative souls of plants. What is true of soul as the form or act of the organic body as a whole is also true, with one exception, of the parts of the soul, i.e., each of its various powers is the power of a part of the body, a living organ. Thus, the power of digestion is embodied in the stomach; the power of vision, in the eye and brain; the power of memory or imagination, in the brain; and so on.

The one striking exception, according to Aristotle, is the power of understanding or intellection—the power of conceptual thought. This one power (distinctive of the rational soul that is the form of the human body) belongs to the living or besouled man in exactly the same way that his power of digestion or his power of perception does; but unlike all his other powers, this one power is not the power of any bodily organ. It alone is an immaterial power; its acts are not the acts of any bodily organ; yet its acts never occur without the accompaniment of sensory or perceptual acts, especially acts of imagination and memory, that are themselves acts of corporeal powers, i.e., acts of the sense organs and of the brain. [37]

The immateriality of the intellectual or conceptual power does not create a mind-body problem for Aristotle; for, as I just remarked, this immaterial power, no less than the other corporeal powers, belongs to man the living organism, composite of matter and form; it functions co-operatively with other corporeal powers (i.e., affects them and is affected by them), especially man's sensory or perceptual powers; and it cannot function in any other way because man is a unity both in existence and in operation.

I hope that this brief digression into Aristotelian theory has now explained why I regard it as paradoxical that Aristotle and his follower Aquinas should supply us with the one argument

for the immateriality of the power of conceptual thought that fits into the contemporary dispute of the mind-body problem as a mixed question, involving both science and philosophy, so far as that problem involves the question whether conceptual thought can be adequately explained in neurological terms (i.e., whether the action of the brain is the sufficient cause of conceptual thought), and so directly bears on the question whether man's difference in kind from non-linguistic animals is radical or only superficial. I also hope that this much too brief account of Aristotelian theory will prepare the reader for an equally over-brief summary of the argument itself, which I will now attempt to make. As is so often the case with Aristotle, it is pithily and, perhaps, even somewhat obscurely condensed in a short sentence or two. [38] On the other hand, the argument is spelled out in great detail and with many elaborations in a number of treatises by Aquinas. [39]

The brief version of it that I will now present necessarily omits the metaphysical reasons and the psychological distinctions that make it understandable and persuasive. Hence, I have placed in the notes to this chapter a much more extensive statement of the argument and one that is couched in terms that may make it more intelligible and persuasive to contemporary readers than would the language and ratiocination of Aristotle and Aquinas. I do this in order to give this argument its proper place in the contemporary discussion of the brain's relation to conceptual thought. So far as I can judge from my own fairly extensive reading of the contemporary literature on this subject, the argument is totally unknown. [40] I can do something about making it known, but whether, in the present climate of philosophical speculation, I can make its subtleties and distinctions intelligible is another question.

(8)

The argument in its bare bones hinges on two propositions. The first proposition asserts that the concepts whereby we understand what different kinds or classes of things are like consist in meanings or intentions that are universal. The second proposition asserts that nothing that exists physically is actually universal; anything

that is embodied in matter exists as an individual; and as such it can be a particular instance of this class or that. From these two propositions, the conclusion follows that our concepts must be immaterial. If they were acts of a bodily organ such as the brain, they would exist in matter, and so would be individual. But they are universal. Hence, they do not and cannot exist in matter, and the power of conceptual thought by which we form and use concepts must be an immaterial power, i.e., one the acts of which are not the acts of a bodily organ.

The reasoning that supports the first proposition is as follows. Our common or general names derive the meanings they carry from the concepts we have. The meaning of a common or general name is universal in its denotation and its connotation; that is to say, a common or general name always signifies a class of objects, never any particular instance or member of the class. Therefore, the concept that confers meaning on a common or general name must be a universal meaning—an act of the mind which has an intentionality that is universal. Were it otherwise, the concepts that we form when we exercise our power of conceptual thought would not enable us, as they do, to understand what it is like to be a dog, or a poodle, or a quadruped—or an electron, a galaxy, and so on.

The second proposition is supported by the facts of common experience. The objects of our common experience are all individual things, i.e., this individual dog, or poodle, or quadruped. One and the same individual object may be a whole variety of particulars according as it is a member of a whole variety of classes; the object lying at my feet is this one unique individual thing, but is many particulars, for it is this particular dog, this particular poodle, this particular quadruped. The same holds true of objects outside the domain of common experience, such as the theoretical entities that are the posited objects of scientific knowledge. Each elementary particle moving about in a cyclotron is that one individual particle, though this individual particle may be a particular electron, and that individual particle may be a particular neutron.

The facts just stated lead to the generalization that all physical objects, whether they are objects of common experience or objects of scientific knowledge, are individual things. This generalization can be stated in the following proposition and its converse:

the proposition is that whatever exists physically (i.e., whatever is embodied in matter) exists as an individual; and the converse proposition is that whatever exists as an individual exists physically. Since these two propositions state empirical generalizations, they are capable of being falsified by a single negative instance. But no negative instance has yet been found; no one has ever produced an existent object of common experience or of scientific knowledge that is at once physical or material in its mode of existence and also universal in character (i.e., a class of things rather than an individual thing).

The argument then reaches its conclusion as follows. Our concepts are universal in the character of their intentionality. Hence they do not exist physically; they are not embodied in matter. Since our concepts are acts of our power of conceptual thought, that power must itself be an immaterial power, one not embodied in a physical organ such as the brain. The action of the brain, therefore, cannot be the sufficient condition of conceptual thought, though it may still be a necessary condition thereof, insofar as the exercise of our power of conceptual thought depends on the exercise of our power of perception, memory, and imagination, which is a corporeal power embodied in our sense organs and brain. [41] (If it can be shown that any other animal, such as the dolphin, has the power of propositional speech and, therefore, the power of conceptual thought, the argument just stated would lead to the same conclusion about the dolphin; namely, that it had an immaterial power and that the action of the dolphin brain may be a necessary, but cannot be the sufficient, condition of the dolphin's engaging in propositional speech and conceptual thought.)

(9)

Proponents of the identity hypothesis, as we noted earlier in this chapter, raise a number of objections or difficulties against their own position and then undertake to answer or resolve them. Opponents of the position have advanced additional criticisms. In the give-and-take of contemporary discussion, the adherents of the identity hypothesis have found occasion to reply to some of these. But the non-identity hypothesis that I have described

as a moderate immaterialism—the theory of intellect or mind developed by Aristotle and Aquinas—appears to be totally neglected in the contemporary discussion. From Ryle on, the only theory of mind that the exponents of the identity hypothesis hold up for ridicule or refutation is the Platonic or Cartesian form of extreme immaterialism that they interpret as positing the ghost in the machine, and against which they argue, in terms of the principle of parsimony, that the ghost need not be posited in order to explain human behavior, including linguistic behavior and conceptual thought. This adverse argument does not, of course, apply to the Aristotelian or Thomistic form of moderate immaterialism. In fact, the proponents of that position claim that the principle of parsimony works in the opposite direction to justify positing the immateriality of the power of conceptual thought in order to explain the universal intentionality of its acts.

Because the moderate immaterialism of Aristotle and Aquinas is totally neglected or ignored in the contemporary discussion, we cannot look for criticisms of it, or objections to it, in current philosophical literature. Aquinas, however, did himself raise one objection against his own theory; and at least two others can be readily thought of. I will now present these three objections, together with replies that are consonant with the position to be defended.

First objection and reply. The clinical data of brain pathology, especially brain injuries that are accompanied by disorders of speech and by the loss of understanding, show the involvement of the brain in the processes of conceptual thought; just as other brain injuries causing blindness or deafness show the involvement of the brain in perceptual processes. Hence, the one set of processes, like the other, must be a function of the brain. This objection is raised by Aquinas, who mentions the interference with conceptual thought that results from brain injuries, as well as the interference that results from the effect of toxic substances and fatigue poisons on the action of the brain. [42]

His reply consists in pointing out that there is no inconsistency between admitting the involvement of the brain in conceptual thought and asserting the immateriality of conceptual thought. All that the evidences from brain pathology show is that the brain is a necessary condition of conceptual thought; and in order to

deny that the brain is the sufficient condition of conceptual thought, one does not have to deny that it is a necessary condition.

The error of the objection consists in treating conceptual and perceptual processes as wholly alike in being functions of the brain; i.e., in treating *visual* blindness (loss of sight) as if it were the same as *conceptual* blindness or *agnosia* (loss of understanding). [43] To treat them as the same is to ignore the argument for the immateriality of conceptual thought. The objection can hardly invalidate an argument that it ignores.

Second objection and reply. The human infant is not born able to exercise the power of propositional speech. It is only in the course of maturation that that power comes into operation and develops with exercise. The infant's first use of names or designators and his first utterance of sentences do not occur until, with growth, his brain reaches a certain magnitude. Hence, it would appear that there is a critical threshold in the continuum of brain magnitudes, above which the human being has and below which he lacks propositional speech. But the presence of propositional speech is our only objective evidence of the presence of conceptual thought; and so it can be argued that engaging in conceptual thought depends, as engaging in propositional speech depends, on a certain brain magnitude. [44]

The reply to this objection, like the reply to the preceding one, concedes that conceptual thought depends on the brain, and especially on its having a certain magnitude. However, all that this shows is that the brain, or a certain magnitude of it, is a necessary condition of conceptual thought. The argument for the immateriality of conceptual thought, the whole point of which is to show that the brain is not the sufficient condition of conceptual thought, remains untouched by this objection.

Third objection and reply. It has been conceded that animals and machines are capable of perceptual abstractions. Rats can learn to react to individually different triangles *as if* they all had some characteristic in common (their triangularity) that is not shared by other visible shapes; and some success has been achieved in getting machines to recognize different shapes in an apparently

discriminating manner (i.e., react in one way to square shapes, and in another to triangular shapes). It would thus appear that animals and machines are able to apprehend universals—classes or kinds of objects. [45] But unless an immaterial power is to be attributed to subhuman animals and to machines, it would seem to follow that an immaterial power need not be posited to explain man's apprehension of classes or kinds of objects. Hence, even if it is granted that the concepts whereby we know kinds or classes are universal intentions, that does not justify our positing the immateriality of the power of conceptual thought.

The reply to this objection turns on preserving the distinction that was made in Chapter 10, between perceptual abstraction and concept-formation. Let me repeat it briefly here.

A perceptual abstraction, as attained by men or other animals, is an acquired disposition to perceive a number of sensible particulars as being of the same kind or as sufficiently similar to be reacted to in the same way; it is also a disposition to discriminate between similar and dissimilar particulars. It is not a disposition to recognize a single perceived particular as being of a certain kind, for the recognition of a single perceived particular as being of a certain kind is inseparable from the understanding of the kind itself. These related acts of recognition and understanding presuppose more than perceptual abstraction; they presuppose concept-formation. In a laboratory rat that has learned a food cue, a perceptual abstraction or generalization enables it to perceive that this shape and this shape (e.g., triangular shapes) but not that shape or that (e.g., circular shapes) are sufficiently alike to serve as the cue for a certain response. But such perceptual generalization and discrimination does not dispose the rat to recognize that this shape by itself is a triangle or to understand triangularity when no triangular shapes are perceptually present. Only a man, having the concept of triangularity, can recognize this perceived shape as being an instance of triangularity, and can, in the absence of any perceived shape, understand triangularity and the distinction between it and circularity. By means of a perceptual abstraction, like that attained by the laboratory rat, a man can also perceive a number of sensible particulars as similar shapes and discriminate between them and dissimilar shapes, but his recognition that the similar shapes are all triangles and that the dis-

similar shapes are circles derives from his concepts of triangle and circle, which operate in conjunction with his perceptual abstractions. [46]

The central point here is that perceptual abstractions do not function in the same way in man, on the one hand, and in non-linguistic animals and in machines, on the other; because in man they operate in conjunction with concepts, and in other animals and machines, they do not. Now it is only the intentionality of concepts that is universal. It is only through concepts that we are able to understand kinds or classes of objects; and it is only through concepts in conjunction with perceptual abstractions that we are able to recognize this perceived object as being of a certain kind or class that we understand. Perceptual abstractions by themselves, functioning in the absence of concepts as they do in animals and machines, can do no more than enable the animal or machine to discriminate between perceived particulars according to whether they are sufficiently alike or sufficiently different to warrant this or that reaction. [47]

Since, unlike concepts, perceptual abstractions do not have an intentionality that is universal in character, immateriality need not be attributed to the power of which they are acts. This holds true for all other acts of the power of perceptual thought, such as the acts of memory and imagination. Hence, even if these acts have intentionality, as all cognitive acts do, the type of intentionality they have is such that they can be acts of a bodily organ. It is only an intentionality that is universal in character and that is characteristic of conceptual acts, but not of perceptual acts, which warrants attributing immateriality to a cognitive power. Hence, the objection might have some force against the position held by Brentano and those who adopt his thesis that all cognitive acts have intentionality in the same sense; but it has no force against the position of Aristotle and Aquinas, who distinguish between the intentionality of conceptual and the intentionality of perceptual acts, and regard them as only analogous because the one is universal in character and the other is not.